AMENDMENTS TO THE SPECIFICATION:

Please add the following paragraph after the title of the invention:

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation application of U.S. Application Serial No. 09/287,424 filed April 7, 1999.

Please replace paragraph [0002] at page 1, with the following amended paragraph:

[0002] The type or concentration of blood components, such as metabolites, proteins, lipids, electrolytes, enzymes, antigens, and antibodies, is measured, in general, using a plasma or serum sample obtained by centrifuging whole blood. However, centrifuging cannot be incorporated into a line, and takes labor and time. Particularly, centrifuging is unsuitable for an urgent case of measuring a small number of samples promptly and ~~in~~ on site inspection, because of requiring a centrifuge and electricity. ~~Thereupon, it has been investigated to separate~~ Therefore, the separation of serum from whole blood by ~~filtration~~ has been investigated.

Please replace paragraph [0004] at page 1, with the following amended paragraph:

[0004] However, practical filtration methods capable of obtaining an amount of plasma or serum from whole blood necessary for measuring by an automatic analyzer have not been developed except ~~a part of items~~ for a specialized test, such as blood sugar.

Please replace paragraph [0007] at page 2, with the following amended paragraph:

[0007] However, since the blood filter units already developed filter blood one by one, it is desired to develop a continuous filtration apparatus for filtering many blood samples ~~successibly~~ successively using the blood filter units in order to improve working efficiency.

Please replace paragraph [0067] at page 6, with the following amended paragraph:

[0067] The manifold connects between the suction line and respective blood filter units, and is composed of a main pipe and branches. The main pipe may be either fixed or moved vertically in a linear form of rectangular box or straight pipe, or rotated in a form of circular box or ring pipe. In the case of ring-shaped, a connecting port to the suction line is provided at the center, and the ring-shaped main pipe is connected thereto through connecting pipe(s). The rotation of the manifold is ~~continuously or intermittently~~ continuous or intermittent.

Please replace paragraph [0068] at page 6, with the following amended paragraph:

[0068] A valve and a connector are provided at the end of each branch. The valve opens upon attaching the blood filter unit and ~~closed~~ closes upon detaching it. The valve may be any type capable of being accommodated thereto, such as in the cock type, the push valve type, the butterfly valve type, the disc valve type, the gate valve type, the ball valve type, the bell center valve type, or the like in structural viewpoint, and the mechanical valve type, the electromagnetic valve type, or the like in working viewpoint. In the mechanical valve type, when the attaching (detaching) direction of the blood filter unit conforms to the opening (closing) direction of the valve, the valve can be opened or closed by the movement of the connector by connecting the valve body with the connector through a connecting rod or the like. As another means, the valve body can be returned by the suction of the suction line upon the detaching of the blood filter unit without connecting the valve body with the connector. In the case that the attaching (detaching) direction of the blood filter unit is opposite to the opening (closing) direction of the valve, the direction can be changed by using a lever mechanism. In the case of using an electromagnetic valve, the electromagnetic valve can be actuated by a switch which is changed over by the movement of the blood filter unit.

Please replace paragraph [0071] at page 8, with the following amended paragraph:

[0071] The conveyor conveys the blood reservoirs. When the blood reservoirs are held by racks or the like, the conveyor is composed of a endless belt, chain or the like. Instead, racks for holding the blood reservoir can be mounted to the conveyor. The movement of the conveyor may be either ~~intermittently~~ intermittent or ~~continuously~~ continuous. When the manifold is rotated, the movement of the conveyor can be synchronized with the manifold.

Please replace paragraph [0072] at page 8, with the following amended paragraph:

[0072] The form of the rack is disc, ~~squire~~ square plate, band or the like. The rack holds and positions the blood filter unit so as to be attachable to and detachable from the connector of each branch of the manifold. The simplest structure of the rack is a plate or box having a single or plural openings into which the blood filter unit is inserted to engage the flange to the periphery of the opening.

Please replace paragraph [0077] at page 10, with the following amended paragraph:

[0077] Preferable glass fiber filter has a density of about 0.02 to 0.5 g/cm ^{3}, preferably about 0.03 to 0.2 g/cm^3, more preferably about 0.05 to 0.13 g/cm^3, a retainable particle size of about 0.6 to 9 μm preferably 1 to 5 μm. By treating the surface of glass fiber with hydrophilic polymer as disclosed in Japanese Patent KOKAI Nos. ~~2-208676~~ 2-208565, 4-208856, filtration proceeds ~~more fast and~~ faster and more smoothly. Lectin or other reactive reagent or modifier may be incorporated into glass fiber, or glass fiber may be treated therewith. Two or more glass fiber filters may be superimposed.

Please replace paragraph [0079] at page 10, with the following amended paragraph:

[0079] Preferable microporous membranes are ~~polysultone~~ polysulfone membrane, cellulose acetate membrane and the like, and particularly preferred one is polysulfone membrane. In the blood filtering material of the invention, the glass fiber filter is located on the blood inlet side and the microporous membrane in located on the filtrate outlet side. The most preferable blood filtering material is a combination of the glass fiber filter and polysulfone membrane superimposed in this order from the blood inlet side.

Please replace paragraph [0081] at page 11, with the following amended paragraph:

[0081] The quantity of whole blood filterable by this system is greatly influenced by the void volume existing in glass fiber filter and the volume of blood cells in the whole blood. When the density of the glass fiber filter is high (~~pure~~ pore size to retain particles is small), erythrocytes are trapped in the vicinity of glass fiber filter surface, voids in the glass fiber filter are clogged in a very thin region from the surface, and accordingly, filtration does not proceed thereafter. As a result, recovered plasma volume by filtration is small. On that

occasion, when the filter material is sucked by stronger suction in order to increase recovered plasma volume, blood cells are destroyed, i.e. hemolyzed. That is, the filtration becomes similar to surface filtration, and utilization rate of void volume of the filter is low.

Please replace paragraph [0083] at page 12, with the following amended paragraph:

[0083] For example, glass fiber filter ~~20 mm Φ~~ 20 mm in diameter is put in a filter unit, and a 100 ml syringe containing 60 ml water is connected to the top of the filter unit. Water flows down naturally, and volume of water passing through the glass filter from 10 sec to 40 sec after starting is measured as the water permeation volume, and the water permeation speed per unit area is calculated from it.

Please replace paragraph [0091] at page 14, with the following amended paragraph:

[0091] As the material of the holder, thermoplastic or thermosetting plastics are preferable. Illustrative of the plastics are general-purpose ~~plystyrene~~ polystyrene, high impact polystyrene, methacrylate resin, polyethylene, polypropylene, polyester, nylon, polycarbonate, etc. The material may be transparent or opaque.

Please replace paragraph [0092] at page 15, with the following amended paragraph:

[0092] Fitting of the cap to the holder body may be any means, such as adhesion using adhesive or fusion welding. On that occasion, either periphery of the holder body or of the cap is located on the inside, or both peripheries are butted. The fitting may be ~~in a state of~~ detachable utilizing screws or the like.

Please replace paragraph [0094] at page 15, with the following amended paragraph:

[0094] The suction nozzle is connected to the blood inlet of the holder, and sucks blood. The suction nozzle may be integrated with or separated from the holder. In the case of separated, it is enough that the nozzle is joined ~~with~~ in an airtight state, and the joining means may be any means, such as adhesion, fusion, screwing, fitting, or the like.

Please replace paragraph [0097] at page 16, with the following amended paragraph:

[0097] Vacuum blood collecting tubes 6 containing blood sample are conveyed intermittently by a conveyor from the right side in the figure, and the blood filter units 2 supplied by a blood filter unit feeder 8 are put in the vacuum blood collecting tubes 6 one by one. When the vacuum blood collecting tube reaches just under the manifold 1, the connector 5 descends to catch the suction port 22. The valve 4 opens to suck blood sample, and blood filtration is carried out. Each ~~rack 6~~ rack 9 is retained by a retainer (not illustrated), and travels in accordance with the movement of the manifold 1. During ~~rotating the manifold 1 round slowly~~ slow rotation of the manifold 1, blood filtration is finished. Then, the connector 5 releases the suction port 22 and ascends, and the valve 4 is closed. The vacuum blood collecting tube 6 returns to the conveyor 7, and further advances.

Please replace paragraph [0100] at page 16, with the following amended paragraph:

[0100] The manifold ~~1~~ 1'of the apparatus is a long rectangular box. When a vacuum blood collecting tube 6 conveyed by the conveyor 7 comes under a vacant branch 3 discriminated by a sensor or bar code, the rack 9 is grasped by a clamp 70 to ascend. Then, the suction port 22 of the blood filter unit 2 is connected to the branch 3, and blood filtration is carried out. After blood filtration is finished, the blood filter unit 2 is separated from the branch 3, and returns to the conveyor 7, and further advances.

Please replace paragraph [0105] at page 18, with the following amended paragraph:

[0105] The cap 20 has an outer wall 21 and an inner ~~wall 20~~ wall 22 formed concentrically and a cup 23 as the receiver of the filtrate. The outer wall 21 is in the form of a taper having the same inclination angle as the inclined portion 13, and the outside diameter of the outer wall 21 is the same as the inside diameter of the inclined portion 13. That is, the outer wall 21 is fitable to the inclined 13 in a sealing state. A flange 24 is formed outward at the periphery of the outer wall 21, and the flange 24 is bonded to the flange 14 of the holder body 10 by ultrasonic welding. As shown in FIG. 5, a rib 25 is formed on the underside of the flange 24 so as to concentrate the ultrasonic energy there to be bonded to each other to ensure sealing. The rib 25 disappears after bonding.

Please replace paragraph [0108] at page 19, with the following amended paragraph:

[0108] The above blood filter unit has a diameter of the glass fiber filter chamber 11 of ~~20. 1 mm~~ 20.1 mm and a depth thereof of 5.9 mm, a diameter of the microporous membrane chamber 12 of 21.0 mm, a diameter of the upper end of the inclined portion of 22.5 mm and a depth thereof of 2.10 mm, a diameter at the lower end of the outer periphery of the outer wall 21 of 20.98 mm and a height between the underside thereof and the flange 24 of 2.0 mm, an inside diameter of the inner wall 22 of 15.0 mm, and an inside diameter of the cup 23 of 7.5 mm. The glass fiber filter 30 consists of six glass fiber filter sheets each having a diameter of 20.0 mm and a thickness of 0.91 mm, and the microporous membrane consists of one polysulfone microporous membrane having a diameter of 20.9 mm and a thickness of 150 μm.

Please replace paragraph [0112] at page 20, with the following amended paragraph:

[0112] The upper side of the intermediate cap 50 becomes a shallow cone-shaped filtrate receiver 51 deepest at the center, and a ~~discharge port 50~~ discharge port 52 of the filtrate is provided at the center. The peripheral wall of the discharge port 52 is tapered, as shown in FIG. 7, and a step portion 54 is formed at the upper part of the tapered wall 53. The discharge port 52 is closed by fitting a rubber plug 58 having a shape just agreeing with the discharge port 52 and a specific gravity of about 1.1. As shown on the right side in FIG. 7, the plug 58 opens by the pressure added upon filtration to form a gap 55 for passing filtrate. The passage of the filtrate is curved by the step portion 54 of the discharge port 52 and the flange 59 of the plug 58, and spouts obliquely upward. 12 projections 56 are formed at the bottom of the intermediate cap 50 at almost regular intervals. The projections 56 prevent the polysulfone microporous membrane 40 from adhering to the bottom. A flange 57 is formed at the periphery of the intermediate cap 50 which is bonded to the flange 14 of the holder body 10 by welding.